

ProMoSCOPE™ Single Cell Glycosylation Detection Kit

Recent developments in single-cell sequencing technologies enable comprehensive characterization of heterogeneous cell populations which provides insights into different biological processes. However, most current technologies give only a snapshot of genomic sequence or gene expression patterns without information on important processes such as post-translational modifications of proteins.

Glycosylation is an enzymatic process in which carbohydrate groups are attached to the backbone of protein or lipids. Protein glycosylation is one of the most common post translational modifications and can be seen in all living organisms. It influences processes such as protein folding, stability and membrane organization. It also plays important roles in immune responses, host-pathogen interactions, and various other biological processes.

Here we present ProMoSCOPE™, the first commercially available kit that can accurately detect and quantify cell surface glycosylation together with the whole transcriptome at single-cell resolution to decipher the functions of genes and proteins.

Principle

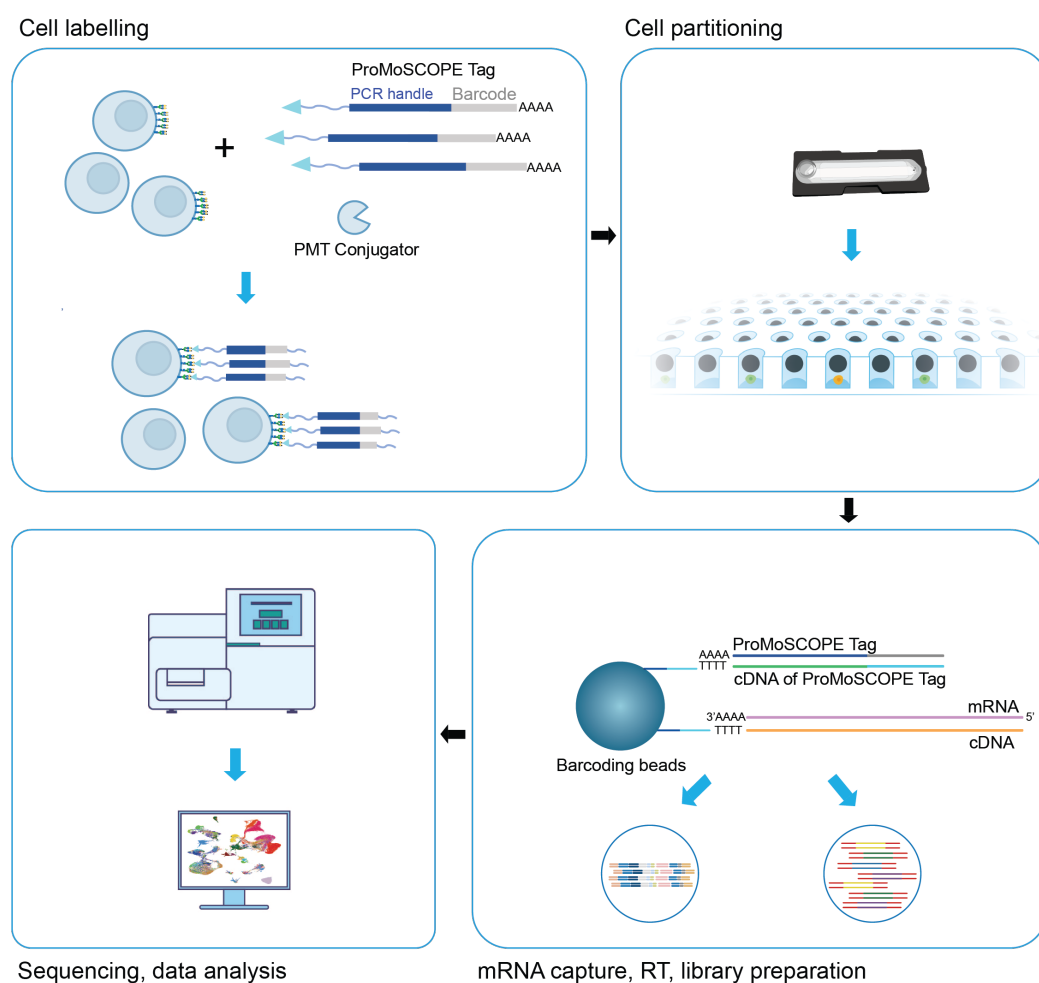


Figure1: Principle of ProMoSCOPE™ technology.

The core technology consists of specially designed ProMoSCOPE-Tag that contains chemical moieties which can recognize and covalently bind to N-Acetyllactosamine (LacNAc), a common glycosylation modification of cell surface proteins. It also contains cell barcode for identifying cell origin and poly A, therefore can be processed together with whole transcriptome. After labeling and cell partitioning, cells are lysed and released mRNA and ProMoSCOPE Tags bind to barcoding beads via poly A tails. After reverse transcription, ProMoSCOPE and total transcriptome libraries can be prepared.

Glycosylation abundance can be detected at single cell resolution

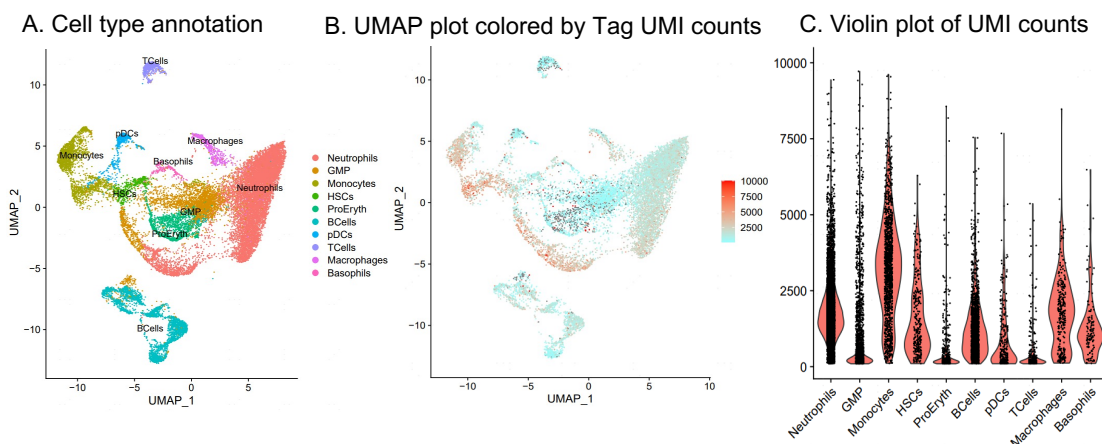


Figure 2: ProMoSCOPE™ reveals heterogeneous glycosylation abundance in the bone marrow.

Bone marrow from mice is extracted and single cell suspensions are loaded to SCOPE-chip® and processed by ProMoSCOPE™ Single Cell Glycosylation Detection Kit. Cells are annotated in the UMAP plot (A). Tag UMI counts indicating glycosylation abundance are presented in (B) and glycosylation abundance in each cluster is shown in the violin plot (C) indicating that immune cells undergo different level of glycosylation.

Highlights

High throughput multi-omics approach linking glycosylation abundance to gene expression

- Simultaneous detection and quantification cell surface glycosylation together with whole transcriptome

Easy workflow:

- No instrument is necessary. Straightforward process to analyze thousands of cells in parallel

Application areas

Systematic insights into the disease mechanisms and tumor heterogeneity

- Discover altered glycosylation mechanisms in cancer



Analyze immune cell response

- Obtain glycosylation abundance and gene expression data simultaneously



Gain insights into host-pathogen interactions

- Study the alterations in glycosylation and understand the mechanisms of host-pathogen interactions



Ordering information

Product	Tissue
	2 RXNs / 16 RXNs
ProMoSCOPE® Single Cell Glycosylation Detection Kit Tissue	1251011 /1251012
ProMoSCOPE® Single Cell Glycosylation Detection Kit Tissue for Matrix	1251021/1251022